

Appln. No. 09/606,679
Amendment Under 37 C.F.R. § 1.111

REMARKS

Claims 1-86 are all the claims pending in the application. Claims 1-36 and 40-86 are rejected. Claims 37-39 are withdrawn from consideration. Claim 36 has been amended. Claims 80 and 85 have been canceled as substantial duplicates of claims 56 and 84, respectively.

Specification

The Examiner has requested a substitute specification because, in the Examiner's opinion, certain phrases that include the article "the" appear to be inconsistent with English idiom. This request is traversed. Applicant submits that the text is wholly readable and understandable with the language that presently appears. One skilled in the art would fully understand the content and meaning of the text. The Examiner has not pointed to any phrase or wording that leads to ambiguity or misunderstanding. If the Examiner points to specific phrases and explains why the language is indefinite and can lead to confusion, appropriate correction will be made by the Applicant.

Notwithstanding the above traversal, Applicant is prepared to remove the article "the" in the instances mentioned by the Examiner upon an indication of allowability of claims.

Claim Rejections - 35 U.S.C. § 112

Claim 36 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. This rejection is traversed for at least the following reasons.

The Examiner objects because the claim is dependent on parent claims that are directed to an article (electron beam drawing mask), while claim 36 refers to the mask being "used" for a particular application. In order to overcome the rejection, Applicant has amended claim 36 to define the mask in the parent claims as "adapted for" being used at a specified voltage, thereby

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further defining the physical characteristics of the article. This recitation is proper and the rejection now should be withdrawn.

Claim Rejections - 35 U.S.C. § 103

Claims 1-36 and 40-86 are rejected under 35 U.S.C. §103(a) as being unpatentable over Katakura et al (6,428,937). This rejection is traversed for at least the following reasons.

First, with regard to claims 80 and 85, this rejection is moot in light of the cancellation of these claims.

Second, with regard to claims 1, 2, 5, 9-12, 14-23, 26-29, 32, 34, 36-40, 47, 48, 55, 56, 57 and 81-84, Applicant has claimed the right to priority based on JP 186954/1999 and has submitted a certified copy of the priority document, receipt of which has been acknowledged by the Examiner in the outstanding Office Action. Applicant's priority date is June 30, 1999, well prior to the 35 U.S.C. § 102(e) date of Katakura et al. Thus, for these claims the rejection should be overcome.

Third, with regard to claims 3 (with respect to Si and P), 4, 6-8, 13, 24, 25, 30, 31 (with respect to TiC), 33(with respect to Si and P), 35, 41-46, 49-54, 58-79 and 86, there are substantial differences between the claimed invention and the teachings of Katakura et al, as is clear from the following analysis.

The Invention

The "electron beam drawing mask blanks" of claims 1-26, 40-79, 81-84 and 86 (referred to herein as "mask blanks") and the electron beam drawing masks of claims 27-36 (referred to herein as "masks") have the following common components. The "mask blanks" (and the "masks") comprise:

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- a **pattern supporting layer 6** for transmitting electron beam therethrough, the pattern supporting layer 6 having no holes;
- an **electron beam scattering layer 5** (referred to as an “electron beam scattering pattern layer” with regard to the masks) formed over the pattern supporting layer 6; and
- a **support member 3** for supporting the pattern supporting layer 6 and the electron beam scattering layer 5, as shown in Fig. 6A (Fig. 5A shows member 3 for a mask).

As subsequently demonstrated, the claimed combination of layers is not found in the prior art patent to Katakura et al.

Katakura et al

Katakura et al discloses a method for fabricating reticle blanks by processing a second major surface 10b of a Si support substrate 11 (namely, the under surface side of the SOI substrate 9). Briefly, in the fabrication method, the SOI substrate 9 is formed by applying the etch-stop layer (namely, SiO layer) 12 and a membrane-forming layer 13, in order, on the first major surface 10a of the Si support substrate 11, as shown in Fig. 1(a). Next, a SiO layer (film thickness of 1-2 μm) 14a and a resist layer (film thickness of 20-30 μm) 14b are formed in order, as a dry etching mask layer, on the second major surface 10b of the Si substrate (namely, the under surface of the Si substrate) 11, as shown in Fig. 1(b). Then, a dry etching process is carried out on the dry etching mask layer for forming the windows 15 as shown in Fig. 1(c).

The important point of Katakura et al is the process for the under surface side of the Si support substrate 11. In other words, the key to the Katakura et al process is the forming step for the struts 11a and the peripheral frame 11b.

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Significantly, none of Figs. 1(a) to 1(f) or Figs. 2(a) to 2(c) illustrate any layer that can correspond to the **electron beam scattering layer 5** of the disclosed and claimed invention.

Katakura et al discloses a fabrication method only with respect to Figs. 1(a) to 1(f) and Figs. 2(a) to 2(c), using above-described materials, and the above-mentioned film thickness. Although a scattering membrane reticle 21 and a scattering-stencil reticle 31 are illustrated in Figs 3(a) and 3(b) of Katakura et al, these reticles 21 and 31 are not formed by the fabrication method of Katakura et al patent. The reticles 21 and 31 are the same as those disclosed in the background of the invention in the specification of the present application (see pages 4 to 7 and Figs. 1 and 4). With respect to Figs. 3(a) and 3(b) of Katakura et al, although the process for the under surface side of the SOI substrate (namely, the fabrication method for the struts 41a and the peripheral frame 41b) is disclosed, the process for the top surface side of the SOI substrate is not disclosed.

Furthermore, the materials for each of the layers (for example, membranes 22 and 32) are disclosed only as being silicon (see column 2, lines 1 and 2). As mentioned above, Katakura et al does not describe or illustrate any teaching with respect to the electron beam scattering layer of the present invention. The relationship between the electron beam scattering pattern and the reticle blank for the scattering-membrane reticle is not disclosed in any fashion or to any degree that would be considered as enabling, such that the present invention would be obvious from such teaching.

Specifically, with respect to the Examiner's comments in the rejection set forth in paragraph item 3, the Examiner states that "Katakura Fig. 2(a) teaches a pattern support layer (ref num. 13a), scattering layer (ref num. 17), ~ ". Applicant respectfully submits that this comment

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reflects a misunderstanding of the reference. Katakura et al does not disclose any scattering layer. The reference number 17 refers to the resist (see column 5, bottom line).

Independent claims 1, 13, 14, 28 to 35 all set forth a scattering layer. At least on this basis, the present invention claimed in is patentably distinct from Katakura et al in structure, as well as materials. These features are not obvious, as they are not considered by Katakura et al. Accordingly, the invention claimed in independent claims 1, 13, 14, 28 to 35 is patentable, and the remaining claims are also patentable because these claims depend from the patentable claims 1, 13, 14, 28 to 35.

With respect to the Examiner's comments in paragraph 4 of the Office Action, for the reason mentioned above, the present invention as defined claimed in independent claims 14, and 28 is different from Katakura et al in structure and size of the components, and is not obvious. Accordingly, the present invention claimed in independent claims 14 and 28 is patentable. Dependent claim 22 is also patentable because this claim depends from the patentable claim 14.

Claim 26 is rejected under 35 U.S.C. §103(a) as being unpatentable over Katakura et al (6,428,937) in view of Yabe et al (5,953,492). This rejection is traversed for at least the following reasons.

This independent claim relates to a mask blank of any of claims 14-16. The Examiner relies on Katakura et al for teachings related to the independent claims and concedes that the reference is silent with regard to stress treatment for the layers. As already demonstrated, Katakura has other deficiencies, as already noted, that support patentability of the parent claims. Moreover, Katakura et al is withdrawn on the basis of Applicant's priority claim. Yabe et al is

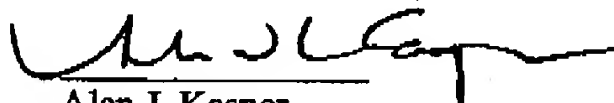
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not relied upon by the Examiner to remedy these deficiencies and, in any event, is wholly inadequate to support a rejection of the claims by itself.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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